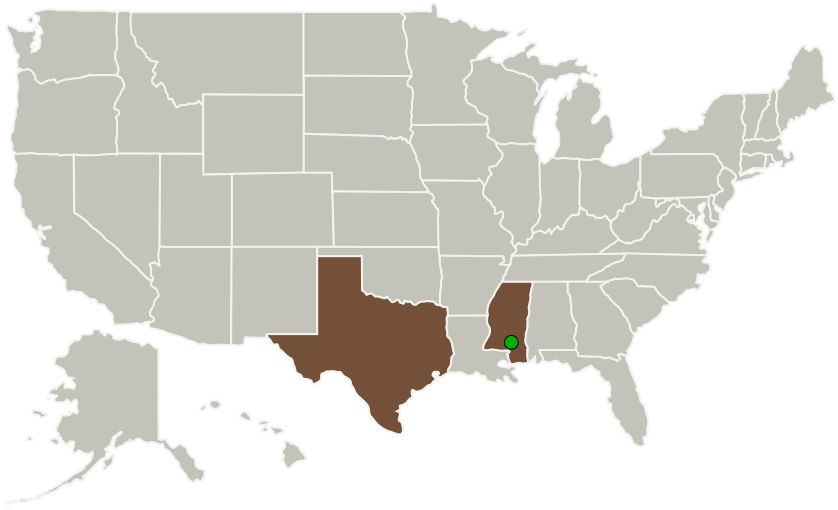
Heat Harvesting by Artificial Muscles, Phase I

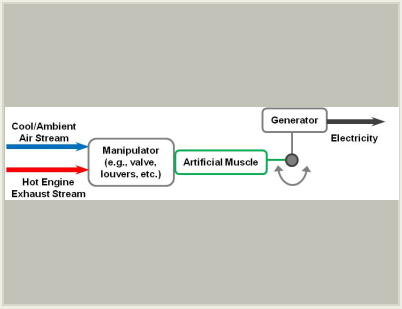
Completed Technology Project (2014 - 2014)

Project Introduction

NASA emphasizes the need to implement energy harvesting in its future mission activities. By harvesting energy from the ambient surroundings, there is less dependence on a primary power supply (e.g., combustion engines, fuel cells, batteries, solar cells, etc.). Overall power consumption is thereby reduced, equipment weight goes down and logistical supply needs are simplified. Future NASA missions will need innovative energy harvesting methods that are cost effective with reduced mass, reduced volume, and that accommodate extreme operating conditions. For this STTR application, Lynntech has teamed Dr. Ray Baughman (Director of NanoTech Institute, University of Texas at Dallas) to pioneer the use of artificial muscles (also known as coiled polymer actuators) as an advanced method for heat-to-electricity energy harvesting. Our primary application is to harvest waste heat from airplane engines, but it could be adapted for use in many other applications where waste heat is generated.

Primary U.S. Work Locations and Key Partners





Heat Harvesting by Artificial Muscles Project Image

Table of Contents

Heat Harvesting by Artificial Muscles, Phase I

Completed Technology Project (2014 - 2014)

Organizations Performing Work	Role	Type	Location
Lynntech, Inc.	Lead Organization	Industry	College Station, Texas
Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi
The University of Texas at Dallas	Supporting Organization	Academia	Richardson, Texas

Primary U.S. Work Locations	
Mississippi	Texas

Project Transitions

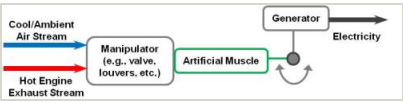
June 2014: Project Start

December 2014: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140628)*

Images



Project Image
Heat Harvesting by Artificial Muscles Project Image
(https://techport.nasa.gov/image/137176)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Lynntech, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Anuncia Gonzalez-martin

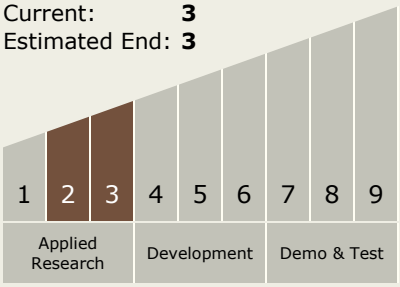
Co-Investigator:
Anuncia Gonzalez-martin

Heat Harvesting by Artificial Muscles, Phase I

Completed Technology Project (2014 - 2014)

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.1 Power Generation and Energy Conversion
    - TX03.1.4 Dynamic Energy Conversion

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System